Appendixes

Appendix A

Statement of Task

The Space Studies Board will conduct a study to develop a science strategy for solar system exploration. The study will survey the state of knowledge and then lay out the most important scientific questions facing planetary science today. Key areas will include small bodies, primitive bodies including the trans-Neptune realm, the major planets, the moons of the outer solar system, and the inner planets. Because of its rich scientific interest and programmatic prominence, the exploration of Mars will receive individual attention.

The science strategy will contain the following key components:

1. A big picture of solar system exploration—what it is, how it fits into other scientific endeavors, and why it is a compelling goal today;
2. A broad survey of the current state of knowledge about our solar system today;
3. An inventory of the top-level scientific questions that should provide the focus for solar system exploration today; and
4. A prioritized list of the most promising avenues for flight investigations and supporting ground-based activities.

In the special case of Mars, the Board will incorporate the findings of its parallel scientific review of Mars science priorities and implications for NASA's Mars exploration program (*Assessment of Mars Science and Mission Priorities*, National Academy Press-prepublication text, 2001). The Mars Exploration program elements addressed in the earlier study should be treated as a single component in the new survey rather than attempting to reprioritize individual nearer-term (<2007) Mars missions against other solar system exploration mission candidates. Mars science, however, should be well integrated with the broader scientific goals.

In presenting these prioritized objectives, it would be most useful to provide prioritized lists of missions that are too large to be undertaken within the Discovery program (i.e., life cycle costs exceeding $300 million) and that could be expected to go into implementation during the next decade. These lists should be broken down into a small number of cost categories (e.g., <$325 million, $325 million to $650 million, and >$650 million). For objectives that could likely be met within or below the Discovery cost-caps, on the other hand, the most valuable guidance would take the form of prioritized science goals. The report should separate the presentation of specific implementation recommendations from the science discussion. Mars missions should be prioritized separately from non-Mars missions.

In conduct of the study, the scientific community will be as broadly canvassed as possible given the time available. The findings of a number of recent Space Studies Board reports on focused topics in solar system exploration will also be incorporated in the study.

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